

**LPDES PERMIT NO. LA0005312 (Agency Interest No. 312)**

**LPDES FACT SHEET and RATIONALE  
FOR THE DRAFT LOUISIANA POLLUTANT DISCHARGE ELIMINATION SYSTEM  
(LPDES) PERMIT TO DISCHARGE TO WATERS OF LOUISIANA**

- I. Company/Facility Name:** Calumet Lubricants Company, L.P.  
Cotton Valley Refinery  
Post Office Box 97  
Cotton Valley, Louisiana 71018
- II. Issuing Office:** Louisiana Department of Environmental Quality (LDEQ)  
Office of Environmental Services  
Water Permits Division  
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**Date Prepared:** January 4, 2010

LAC 33:IX Citations: Unless otherwise stated, citations to LAC 33:IX refer to promulgated regulations listed at Louisiana Administrative Code, Title 33, Part IX.

40 CFR Citations: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations in accordance with the dates specified at LAC 33:IX.4901, 4903, and 2301.

**IV. Permit Action/Status:**

**A. Reason For Permit Action:**

Proposed reissuance of a Louisiana Pollutant Discharge Elimination System (LPDES) permit for a 5-year term following regulations promulgated at LAC 33:IX.2711/40 CFR 122.46.

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- B. LPDES permit: Permit effective date: February 1, 2005  
 Permit expiration date: January 31, 2010

EPA has not retained enforcement authority.

- C. Application submittal date: Application received on July 29, 2009, application addendum received on November 13, 2009

**V. Facility Information:**

- A. Location – 1757 Old Highway 7, Cotton Valley, Webster Parish
- B. Applicant Activity -

According to the application, Calumet Lubricants is a petroleum refinery that uses atmospheric distillation and hydrotreating to refine sweet crude into various petroleum products including but not limited to aliphatic and hydrotreated low aromatic solvents, light straight run, and atmospheric tower bottoms.

Below is a summary of the production rates:

<u>Process</u>	<u>Proposed Production (1000 bbl/day)</u>
Feedstock Rate	12.1
Atmospheric Crude Distillation	12.1
Crude Desalting	12.1
Hydrotreating	5.1
Ballast Flow	0
Stormwater Flow	82,000 GPD

- C. Technology Basis - (40 CFR Chapter 1, Subchapter N/Parts 401, 405-415, and 417-471 have been adopted by reference at LAC 33:IX.4903)

<u>Guideline</u>	<u>Reference</u>
Refinery Guidelines	40 CFR 419, Subpart A

Other sources of technology based limits:

- LDEQ Stormwater Guidance, letter dated 6/17/87, from J. Dale Givens (LDEQ) to Myron Knudson (EPA Region 6)
- Best Professional Judgement

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- D. Fee Rate -
  - 1. Fee Rating Facility Type: Major
  - 2. Complexity Type: V
  - 3. Wastewater Type: II
  - 4. SIC code: 2911
- E. Continuous Process Effluent Flow - 0.60 MGD (30-Day Maximum)

**VI. Receiving Waters:** Bayou Dorcheat via French Creek, Dry Creek and Davis Slough

- A. TSS (15%), mg/L: 5.35 mg/l\*
- B. Average Hardness, mg/l.  $\text{CaCO}_3$ : 25.12 mg/l\*
- C. Critical Flow, cfs: 0.1 \*
- D. Mixing Zone Fraction: 1\*
- E. Harmonic Mean Flow, cfs: 1\*
- F. River Basin: Red River, Segment No.: 100501
- G. Designated Uses: primary contact recreation, secondary contact recreation, fish and wildlife propagation, agriculture, and outstanding natural resource waters

\* Information based on the following: Memorandum from Todd Franklin to Melanie Connor dated January 28, 2010. Determinations of water quality characteristics were taken from ambient monitoring station #2584 (Little French Creek at the bridge on City Street about 0.1 mile east of Highway 371 in Cotton Valley). See Appendix C

**VII. Outfall Information:**

Outfall 001

- A. Type of wastewater – Continuous discharge of once through non-contact cooling water
- B. Location – At the point of discharge of once-through non-contact cooling water into the firewater reservoir prior to combining with the waters of the unnamed tributary to French Creek (Latitude 32° 48' 02", Longitude 93° 24' 38")
- C. Treatment – lagoon
- D. Flow -- Continuous: 0.24 MGD (30-day Maximum)

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- E. Receiving waters – Bayou Dorcheat via French Creek, Dry Creek and Davis Slough
- F. Basin and segment – Red River Basin, Segment 100501

Outfall 002

- A. Type of wastewater – The continuous discharge of process wastewaters including tank water draws, railcar and truck loading rack washwater; general facility washwater, maintenance wastewater; process area stormwater; non-process area stormwater; boiler and cooling tower blowdown; green sand filter backwash; water softener unit regeneration wastewater and backwash; lab sink wastewater; recovery well groundwater; digester and dewatering wastewater; and miscellaneous wastewaters including but not limited to fire systems test water, eye wash stations and safety shower, steam condensate and hydrostatic test wastewater.
- B. Location – At the point of discharge from the treatment facility (Pond B) prior to combining with other waters (Latitude 32° 47' 56", Longitude 93° 24' 35")
- C. Treatment – oil water separation, activated sludge, clarification, aerated lagoons, and neutralization.
- D. Flow – Continuous, 0.36 MGD (30-Day Maximum)
- E. Receiving waters – Bayou Dorcheat via French Creek, Dry Creek and Davis Slough
- F. Basin and segment – Red River Basin, Segment 100501

Outfall 003

- A. Type of wastewater – The intermittent discharge of non-process area stormwater, post first flush process area stormwater\*, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate

\* Post first flush stormwater shall be defined as the stormwater discharges that occur after the first 1 inch of rainfall in a 24-hour period.

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- B. Location – At the point of discharge from the overflow weir at the northern end of Pond C prior to combining with other waters (Latitude 32° 48' 04", Longitude 93° 24' 37")
- C. Treatment – Oil water separator of post flush stormwater and settling
- D. Flow – Intermittent, 1.60 MGD (30-Day Maximum)
- E. Receiving waters – Bayou Dorcheat via French Creek, Dry Creek and Davis Slough
- F. Basin and segment – Red River Basin, Segment 100501

Outfall 004

- A. Type of wastewater – The intermittent discharge of non-process area stormwater, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate
- B. Location – At the point of discharge from the underflow weir from the oil/water separator near the northeast corner of the firewater reservoir prior to combining with other waters (Latitude 32° 48' 06", Longitude 93° 24' 37")
- C. Treatment – Oil water separator
- D. Flow – Intermittent, 1.24 MGD (30-Day Maximum)
- E. Receiving waters – Bayou Dorcheat via French Creek, Dry Creek and Davis Slough
- F. Basin and segment – Red River Basin, Segment 100501

Outfall 005

- A. Type of wastewater – The intermittent discharge of non-process area stormwater, previously monitored discharges from Outfall 001, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate
- B. Location – At the point of discharge from the overflow weir from the firewater

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reservoir prior to combining with other waters (Latitude 32° 48' 05", Longitude 93° 24' 39")

- C. Treatment – Oil water separator, settling
- D. Flow – Intermittent, 0.72 MGD (30-Day Maximum)
- E. Receiving waters – Bayou Dorcheat via French Creek, Dry Creek and Davis Slough
- F. Basin and segment – Red River Basin, Segment 100501

#### **VIII. Proposed Permit Limits and Rationale:**

The specific effluent limitations and/or conditions will be found in the draft permit. Development and calculation of permit limits are detailed in the Permit Limit Rationale section below.

The following section sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guideline or performance standard provisions as required under LAC 33:IX.2707/40 CFR Part 122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

##### **A. REQUESTED PERMIT CHANGES**

1. The permittee requested revisions in the wastewater descriptions for all outfalls. These changes have been made in the permit.
2. The permittee requested a reduction in the monitoring frequency for TOC (net) and pH at Outfall 001 from 2/month to 1/month. This Office concurs with this request. The change has been made in the permit.
3. The permittee requested monitoring frequency reductions for oil & grease, COD, ammonia, sulfide and phenolic compounds at Outfall 002 based upon the USEPA Memorandum "Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies". Based upon the facility's effluent data, indicating a ratio of the long term monthly average to the monthly average permit

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limit of less than 25%, the monitoring frequencies for COD, ammonia and sulfide have been reduced 1/month. The requested monitoring frequency reduction for oil and grease and phenolic compounds has been denied. (See Section E below).

4. The permittee requested that this Office add the following parameters and respective Limits of Quantitation (LOQ) to Part II of the permit whereby if an analytical test result is less than LOQ, a value of zero may be used for that individual result for purposes of calculating and reporting mass: oil & grease, (5.0 mg/l), COD (20 mg/l), ammonia (0.02 mg/l), sulfide (0.02 mg/l), and phenolic compounds (0.005 mg/l). This Office concurs with this request. The permittee may report zero (0) for Oil & Grease, COD, Sulfide, Ammonia, and Phenolic Compounds if it is not detected in laboratory analyses, as long as an EPA approved method is being used by the laboratory which specifies the minimum levels of quantification listed above. These minimum levels of quantitation have been specified Part II of the permit.
5. The permittee requested that this Office establish a BOD concentration limitation (15 mg/l daily maximum) at Outfall 002 that is seasonal rather than year round. Although the Bayou Dorcheat TMDL for Dissolved Oxygen only requires summer reductions for one municipality, in order to prevent further impair of the subsegment, this Office determined that all other point sources shall retain limitations as previously established. Because the facility has reported several excursions of the BOD concentration limitation, this Office has denied the request for seasonal (summer only) limitations.

B. PERMIT CHANGES

1. Outfall 002 – Based upon new water quality screening, water quality limitations have been established in the permit for Chromium VI and Phenolic Compounds
2. Biomonitoring requirements – The biomonitoring dilution series percentages have decreased based upon flow information provided in the July 29, 2009 permit application. Additionally, the previously established wet limit has been removed from the permit, and the monitoring frequency reduction option was removed from the permit. (See Appendix D)
3. The permittee requested that this Office add the following parameters and respective LOQs to Part II of the permit whereby if an analytical test result is less than LOQ, a value of zero may be used for that individual result for purposes of calculating and reporting mass: oil & grease, (5.0 mg/l), COD (20 mg/l), ammonia

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(0.02 mg/l), sulfide (0.02 mg/l), and phenolic compounds (0.005 mg/l). This Office concurs with this request. The permittee may report zero (0) for Oil & Grease, COD, Sulfide, Ammonia, and Phenolic Compounds if it is not detected in laboratory analyses, as long as an EPA approved method is being used by the laboratory which specifies the minimum levels of quantification listed above. These minimum levels of quantitation have been specified Part II of the permit. (see Part II, Paragraph I)

4. Outfall 002 - The monitoring frequencies for COD, ammonia and sulfide have been reduced to 1/month.
5. Outfall 001 - The monitoring frequencies for Net TOC and pH have been reduced to 1/month.
6. Outfall 002 - The limitations for oil & grease and TSS have decreased slightly based upon the production information provided in the July 29, 2009 permit application.
7. Outfall 002 - pH limitations have been established in the permit based upon LAC 33:IX.1113.C.1 and 40 CFR 419, Subpart A.
8. Outfall 001 - the Wet Limitation established in the previous permit has been removed. The WET limit for Calumet Lubricants was implemented as an end result of a TRE required by Order for Information Docket Number VI-89-1776, effective October 25, 1989. The facility was unable to identify a specific toxicant at the close of the TRE, which was completed February 25, 1991. A WET limit was then incorporated into the permit effective November 1, 1994, and was continued in both subsequent renewals effective October 3, 1997 and February 1, 2005. According to the biomonitoring recommendation dated July 8, 2004, no toxic effects had been observed out of 20 *Ceriodaphnia dubia* and 5 *Pimephales promelas* tests during the October 3, 1997 permit cycle. All tests passed at the critical biomonitoring dilution of 100% effluent.

The LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan Volume 3. Version 7 (October 7, 2009) states that "During permit development, the previous five years' WET data will be evaluated using a predictive statistical procedure similar to that presented on pages 52-54 of EPA's Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001), Second Printing. If reasonable potential for WET is determined to exist based on that analysis and considering all other available information, WET limits will be included in the



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permit.” For the current renewal of LA0005312, information (including the previous five years’ WET data and LDEQ’s reasonable potential analyzer) was gathered and included in the agency’s overall determination. The reasonable potential analyzer calls for WET limits to be incorporated into the renewal of LA0005312 based on one January 2007 *Ceriodaphnia dubia* failure. However, the data on file from the past five years (previous permit effective date February 1, 2005) until present shows that toxicity was exhibited in only one out of 21 total biomonitoring tests. This toxicity occurred during the routine 1<sup>st</sup> quarter 2007 test performed on the *Ceriodaphnia dubia*. The required monthly retests were conducted and passed. All other tests for this species (as well as *Pimephales promelas*) passed at the critical biomonitoring dilution of 98%. Based on the analysis of all information, LDEQ has determined that a WET limit is no longer necessary for this facility. In order to generate a complete compliance record, the frequency reduction option will not be available under this reissued permit. This Office has determined that based upon new information (10 years of toxicity data) and in accordance with LAC 33:IX.2707.L.2.a.ii.(a), removal of the WET limit is warranted.

C. TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Following regulations promulgated at LAC 33:IX.2707.L.2.b/40 CFR Part 122.44(l)(2)(ii), the draft permit limits are based on either technology-based effluent limits pursuant to LAC 33:IX.2707.A/40 CFR Part 122.44(a) or on State water quality standards and requirements pursuant to LAC 33:IX.2707.D/40 CFR Part 122.44(d), whichever are more stringent.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Regulations promulgated at LAC 33:IX.2707.A/40 CFR Part 122.44(a) require technology-based effluent limitations to be placed in LPDES permits based on effluent limitations guidelines where applicable, on BPJ (best professional judgement) in the absence of guidelines, or on a combination of the two. The following is a rationale for the limitations established in the permit.

Calumet Lubricants Company, L.P. is subject to Best Practicable Control Technology Currently Available (BPT) and Best Available Technology Economically Achievable (BAT) effluent limitation guidelines listed below:

Manufacturing Operation

Guideline

Petroleum Refining Point Source Category

40 CFR 419, Subpart A

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### WATER QUALITY-BASED EFFLUENT LIMITATIONS

Technology-based effluent limitations and/or specific analytical results from the permittee's application were screened against state water quality numerical standard based limitations by following guidance procedures established in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, October 7, 2009.

In accordance with 40 CFR 122.44(d)(1)/LAC 33:IX.2707.D.1., the existing discharge was evaluated in accordance with the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, October 7, 2009, to determine whether pollutants would be discharged "at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." Calculations, results, and documentation are given in Appendix B.

As a result of the screen, the following pollutants received water quality based effluent limitations:

Phenolic Compounds  
Chromium VI

Minimum quantification levels (MQLs) for state water quality numerical standards-based effluent limitations are set at the values listed in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, October 7, 2009. They are also listed in Part II of the permit.

To further ensure compliance with 40 CFR 122.44(d)(1), whole effluent toxicity testing has been established for Outfall 001 (See Section VII.F below).

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D: PROPOSED EFFLUENT LIMITATIONS

**Outfall 001** – Continuous discharge of once through non-contact cooling water

Parameter	Proposed Permit Limitations		Monitoring Freq.	Rationale
	Monthly Avg	Daily Max		
Flow – MGD	Report	Report	1/day	LAC 33:IX.2707.I.1.b.
TOC (net)	---	5.0 mg/l	1/month	BPJ, Previous permit
pH	6.0 (s.u.)	9.0 (s.u.)	1/month	LAC 33:IX.1113.C.1
Biomonitoring	See Section F below	See Section F below	1/quarter	See Section F below

**EFFLUENT LIMITATIONS BASIS for Outfall 001:**

**Flow:** The requirement to report flow is based upon LAC 33:IX.2707.I.1.b.

**TOC:** Limitations are based upon BPJ for similar types of discharges and the previous permit.

**pH:** Requirements are based upon the previous permit and LAC 33:IX.1113.C.1.

**Whole Effluent Toxicity Testing:** See Section F below for justification of requirements.  
 Biomonitoring samples shall be taken as a flow-weighted composite of Outfalls 001 and 002.

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**Outfall 002** - The continuous discharge of process wastewaters including tank water draws, railcar and truck loading rack washwater; general facility washwater, maintenance wastewater; process area stormwater; non-process area stormwater; boiler and cooling tower blowdown; green sand filter backwash; water softener unit regeneration wastewater and backwash; lab sink wastewater; recovery well groundwater; digester and dewatering wastewater; and miscellaneous wastewaters including but not limited to fire systems test water, eye wash stations and safety shower, steam condensate and hydrostatic test wastewater.

Parameter	Proposed Permit Limits		Monitoring Frequency	Rationale
	Monthly Avg lbs/day	Daily Max lbs/day		
Flow – MGD	Report	Report	1/day	LAC 33:IX.2707.1.1.b.
pH – s.u.	6.0	9.0	1/week	LAC 33:IX.1113.C.1, 40 CFR 419, Subpart A
BOD <sub>5</sub>	30 lbs/day	15 mg/l : 56 lbs/day	1/week	Previous permit
TSS	42	65	1/week	40 CFR 419, Subpart A
Oil & Grease	15	30	1/week	40 CFR 419, Subpart A
COD	149	288	1/month	Previous permit
Ammonia (as N)	3	7	1/month	Previous permit
Sulfide (as S)	0.2	0.4	1/month	40 CFR 419, Subpart A
Phenolic Compounds	0.28	0.66	2/month	Water Quality Based Limitation
Total Chromium	0.5	1.3	1/year	40 CFR 419, Subpart A
Chromium (6+)	0.033	0.079	1/year	Water Quality Based Limitation

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Biomonitoring	See Section F below	See Section F below	1/quarter	See Section F below
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**EFFLUENT LIMITATIONS BASIS for Outfall 002:**

**Flow:** The requirement to report flow is based upon LAC 33:IX.2707.I.1.b. and the previous permit.

**pH:** Requirements are based upon LAC 33:IX.1113.C.1 and 40 CFR 419, Subpart A.

**BOD, COD and Ammonia** – In lieu of establishing limitations calculated based upon 40 CFR 419 Subpart A and the production information provided in the July 29, 2010 permit application, the limitations for BOD<sub>5</sub>, COD and Ammonia have been retained from the previous permit to protect the waterbody from further impairment related to dissolved oxygen. (See Section XV below)

**TSS, Oil & Grease, Sulfide and Total Chromium:** Limitations are based upon 40 CFR 419 Subpart A. See Appendix A for more information on calculation of the limitations.

**Phenolic Compounds, Chromium VI:** Limitations are based upon water quality. See Section VIII.C above, and Appendix B.

**Whole Effluent Toxicity Testing:** See Section F below for justification of requirements. Biomonitoring samples shall be taken as a flow-weighted composite of Outfalls 001 and 002.

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**Outfall 003** – The intermittent discharge of non-process area stormwater, post first flush process area stormwater, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate

**Outfall 004** – The intermittent discharge of non-process area stormwater, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate

**Outfall 005** - The intermittent discharge of non-process area stormwater, previously monitored discharges from Outfall 001, general facility washwater, maintenance wastewater, firefighting and equipment test water, eye wash and safety shower water and steam condensate

Parameter	Proposed Permit Limitations		Monitoring Freq.	Rationale
	Monthly Avg mg/l	Daily Max mg/l		
Flow, MGD	Report	Report	1/quarter	LAC 33:IX.2707.I.1.b.
pH	6.0 s.u. (Min)	9.0 s.u. (Max)	1/quarter	LAC 33:IX.1113.C.1, LDEQ Stormwater Guidance
TOC	---	50	1/quarter	Previous permit, LDEQ Stormwater Guidance
Oil & Grease	---	15	1/quarter	Previous permit, LDEQ Stormwater Guidance

**EFFLUENT LIMITATIONS BASIS for Outfalls 003, 004 and 005:**

**Flow:** The requirement to report flow is based upon LAC 33:IX.2707.I.1.b.

**TOC and Oil & Grease:** Limitations are based upon the previous permit and LDEQ's stormwater guidance [letter dated 6/17/87, from J. Dale Givens (LDEQ) to Myron Knudson (EPA Region 6)].

**pH:** Requirements are based upon the previous permit and LAC 33:IX.1113.C.1.

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E. MONITORING FREQUENCIES

The permittee requested monitoring frequency reductions for oil & grease, COD, ammonia, sulfide and phenolic compounds at Outfall 002 based upon the USEPA Memorandum "Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies". Based upon the facility's effluent data, indicating a ratio of the long term monthly average to the monthly average permit limit of less than 25%, the monitoring frequencies for COD, Ammonia and Sulfide have been reduced 1/month. The requested monitoring frequency reduction for oil and grease has been denied. Based upon current office guidance for reductions to monitoring frequencies at major facilities, this Office will not approve any frequency reductions less than 1/month for most conventional pollutants, or less than 1/week for conventional pollutants such as Oil & Grease. Further, the requested frequency reduction for phenolic compounds has been denied because the limitations established the draft permit are based upon water quality. The permittee must complete at least one permit cycle with the established water quality limitations before being eligible for a frequency reduction.

As requested by the permittee, based upon the facility's compliance, the monitoring frequencies for TOC (net) and pH at Outfall 001 have been reduced to 1/month.

All other monitoring frequencies established in the draft permit are based upon the previous permit. Whole Effluent Toxicity testing frequency is based upon recommendations from the Municipal and General Water Permits Section (see Appendix D).

F. WHOLE EFFLUENT TOXICITY

It has been determined that there may be pollutants present in the effluent which may have the potential to cause toxic conditions in the receiving stream. The State of Louisiana has established a narrative criteria which states, "toxic substances shall not be present in quantities that alone or in combination will be toxic to plant or animal life." The Office of Environmental Services requires the use of the most recent EPA biomonitoring protocols.

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates both the effects of synergism of effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. The biomonitoring procedures stipulated as a condition of this permit for Outfalls 001 and 002 are as follows:

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<u>TOXICITY TESTS</u>	<u>FREQUENCY</u>
NOEC, Pass/Fail [0/1], Lethality, Static Renewal, 7-Day Chronic, <u>Pimephales promelas</u>	1/quarter
NOEC, Value [%], Lethality, Static Renewal, 7-Day Chronic, <u>Pimephales promelas</u>	1/quarter
NOEC, Value [%], Growth, Static Renewal, 7-Day Chronic, <u>Pimephales promelas</u>	1/quarter
NOEC, Pass/Fail [0/1], Growth, Static Renewal, 7-Day Chronic, <u>Pimephales promelas</u>	1/quarter
NOEC, Value [%], Coefficient of Variation, Static Renewal, 7-Day Chronic, <u>Pimephales promelas</u>	1/quarter
NOEC, Pass/Fail [0/1], Lethality, Static Renewal 7-Day Chronic, <u>Ceriodaphnia dubia</u>	1/quarter
NOEC, Value [%], Lethality, Static Renewal, 7-Day Chronic <u>Ceriodaphnia dubia</u>	1/quarter
NOEC, Value [%], Reproduction, Static Renewal, 7-Day Chronic, <u>Ceriodaphnia dubia</u>	1/quarter



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NOEC, Pass/Fail [0/1],  
Reproduction, Static Renewal  
7-Day Chronic,  
Ceriodaphnia dubia 1/quarter

NOEC, Value [%],  
Coefficient of Variation, Static Renewal,  
7-Day Chronic  
Ceriodaphnia dubia 1/quarter

Toxicity tests shall be performed in accordance with protocols described in the latest revision of the "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The stipulated test species are appropriate to measure the toxicity of the effluent consistent with the requirements of the State water quality standards. The biomonitoring frequency has been established to reflect the likelihood of ambient toxicity and to provide data representative of the toxic potential of the facility's discharge in accordance with regulations promulgated at LAC 33:IX.2715/40 CFR Part 122.48.

Results of all dilutions as well as the associated chemical monitoring of pH, temperature, hardness, dissolved oxygen, conductivity, and alkalinity shall be documented in a full report according to the test method publication mentioned in the previous paragraph. The permittee shall submit a copy of the first full report to this Office. The full report and subsequent reports are to be retained for three (3) years following the provisions of Part III.C.3 of this permit. The permit requires the submission of certain toxicity testing information as an attachment to the Discharge Monitoring Report.

This permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.3105/40 CFR 124.5. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

#### Dilution Series

The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. The additional effluent concentrations shall be 29%, 38%, 51%, 68%, and 90% effluent. The biomonitoring critical dilution is defined as 90% effluent.

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## **IX. Compliance History/DMR Review:**

### Enforcement Review:

As of January 29, 2010, the facility has no open enforcement actions.

### DMR Review (January 2008 – December 2009):

<u>Date</u>	<u>Parameter</u>	<u>Outfall</u>	<u>Reported Value</u>	<u>Permit Limit</u>
2/29/2008	TSS	002	50.5 lbs/day	47 lbs/day (mthly avg)
3/31/2008	BOD <sub>5</sub>	002	16.4 mg/l	15 mg/l
7/31/2000	BOD <sub>5</sub>	002	20.6 mg/l	15 mg/l

The facility had 1 toxicity failure in the past five years:

### SPECIES

### DATES CONDUCTED

Ceriodaphnia dubia (water flea):

1/1/2007 – 3/31/2007 (Lethal & sub-lethal)

\* Calumet Lubricants Company, L.P. was referred to enforcement on January 29, 2010 due to the excursions listed above.

### Inspections:

The last inspection of the facility was April 3, 2008. No areas of concern were noted.

## **X. Endangered Species:**

The receiving waterbody for Calumet Lubricants Company, L.P. / Cotton Valley Refinery is Subsegment 100501 of the Red River Basin. The receiving waterbody, Subsegment 100501 of the Red River Basin is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U.S. Fish and Wildlife Service (FWS). This strategy was submitted with a letter dated January 8, 2010, from Rieck (FWS) to Nolan (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat.

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#### **XI. Historic Sites:**

The discharge is from an existing facility location, which does not include an expansion on undisturbed soils. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the "Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits" no consultation with the Louisiana State Historic Preservation Officer is required.

#### **XII. Tentative Determination:**

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to issue a permit for the discharges described in the application.

#### **XIII. Variances:**

No requests for variances have been received by this Office.

#### **XIV. Public Notices:**

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the fact sheet. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

A public notice will be published in a local newspaper of general circulation and in the Office of Environmental Services Public Notice Mailing List.

#### **XV. TMDL Waterbodies:**

Calumet Lubricants Company, L.P. discharges treated process wastewaters, process area stormwater, non-process area stormwater, utility wastewaters, miscellaneous wastewaters, and maintenance wastewaters to Segment 100501.

Segment 100501 was previously impaired for dissolved oxygen/low DO and Mercury. The following TMDLs have been completed:

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Bayou Dorcheat TMDL for Dissolved Oxygen (Subsegment 100501) (April 2, 2008):

The TMDL states that reductions for point source discharges (with the exception of 1 municipality) were not required as a result of this TMDL. In lieu of establishing limitations calculated based upon the production information provided in the July 29, 2010 permit application, the limitations for BOD<sub>5</sub>, COD and Ammonia at Outfall 002 have been retained from the previous permit to protect the waterbody from further impairment. The remaining outfalls (consisting of stormwater and utility wastewaters) have TOC limitations established.

Mercury TMDL for Bayou Dorcheat, Louisiana (Subsegment 100501) (April 2, 2008)

According to the TMDL, "Point sources of mercury were not numerous in the listed subsegments, and accounted for significantly less than 1% of the mercury loads. Therefore, point source loads were not reduced in these TMDLs." No TMDLs were established for specific facilities; therefore no mercury limitations have been included in the draft permit for Calumet Lubricants.

A reopener clause will be established in the permit to allow for the requirement of more stringent effluent limitations and requirements as imposed by any future TMDLs.

**XVII. Stormwater Pollution Prevention Plan (SWP3) Requirements:**

In accordance with LAC 33:IX.2707.1.3 and 4 [40 CFR 122.44(I)(3) and (4)], a Part II condition is proposed for applicability to all storm water discharges from the facility, either through permitted outfalls or through outfalls which are not listed in the permit or as sheet flow. **For first time permit issuance**, the Part II condition requires a Storm Water Pollution Prevention Plan (SWP3) within six (6) months of the effective date of the final permit. **For renewal permit issuance**, the Part II condition requires that the Storm Water Pollution Prevention Plan (SWP3) be reviewed and updated, if necessary, within six (6) months of the effective date of the final permit. If the permittee maintains other plans that contain duplicative information, those plans could be incorporated by reference to the SWP3. Examples of these type plans include, but are not limited to: Spill Prevention Control and Countermeasures Plan (SPCC), Best Management Plan (BMP), Response Plans, etc. The conditions will be found in the draft permit. Including Best Management Practice (BMP) controls in the form of a SWP3 is consistent with other LPDES and EPA permits regulating similar discharges of stormwater associated with industrial activity, as defined in LAC 33:IX.2511.B.14 [40 CFR 122.26(b)(14)].

# **Appendix A**

## **Technology Spreadsheet and Documentation**

**A-1**

**Technology Spreadsheet**

LA0005312 / AI 312      Appendix A-1      Page 1  
 Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.  
 Outfall 002  
 Refinery Guidelines, 40 CFR 419, Existing Source Only

TABLE 1

Spreadsheet: refinery.wk4  
 Developer: Bruce Fielding  
 Software: Lotus 4.0  
 Revision date: 09/07/00  
 Calculation Date: 05/11

## DATA INPUT:

(\*1)

## FACILITY INFORMATION

Permittee: Calumet Lubricants Company, L.P.  
 Permit Number: LA0005312 / AI 312  
 Appendix: Appendix A-1  
 Concentration flow, (MGD):  
 Anti-backsliding, GL vs Old, 0=n, 1=y, 2=GL+Old  
 Outfall number: Outfall 002  
 40 CFR 419 Subpart, (A, B, C, D, or E): A  
 Refinery Type:  
 (Topping, Cracking, Petrochemical,  
 Lube, or Integrated Topping)

(\*2)

## THROUGHPUT RATES

Feedstock (Crude Oil and NGL) Rate to Topping Unit(s): 12.1  
 Process Unit Rates: Input in Table 2

(\*3)

## FLOW RATES

Ballast Flow:

## Stormwater Calculations

Process area, sq. ft. (or acres):  
 Number of Days (Default is 365):

Annual rainfall, inches:

Contaminated Stormwater to Treatment System

(\*4)

## RATIOS:

TOC:BOD5 (Default is 2.2, if needed):

(\*5)

Discharge fraction, default =1

(\*6)

## ANTI-BACKSLIDING INFORMATION:

	(*A)	(*B)	(*C)
	Tech	Old	Antiback
	Avg	Max	0=no scr.
PARAMETER	lb/day	lb/day	1=Old vs GL 2=Old+GL
Conventional:			
BOD5	30	56	1
TSS			
Oil and Grease			
Nonconventional:			
COD	149	288	1
TOC			---
Ammonia	3.1	6.9	1
Sulfide			---
Total Phenolics			---
Metals:			
Chromium (Total)			---
Chromium (6+)			---

(\*7)

## Conversion Utilities:

mg/L-->lbs/day 8.34  
 gpm-->MGD 0.00144  
 gpm-->K gal/day 1.44  
 ft<sup>3</sup>-->gal 7.480519  
 inches-->feet 0.083333  
 acres-->sq. ft. 43560

Ratio:

Fraction:

1

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Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.

Outfall 002

Calculation of Unit Process Rates and Unit Configuration Factors

TABLE 2

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)
			Unit Process Rate			
	EPA	Unit	Total	to	Process	Unit
Process	Process	Rate	Feedstock	Feedstock	Weighting	Process
Number	Rate	K bbl/day	Rate	Ratio *	Factor =	Factor
CRUDE PROCESSES:						
Atmospheric Crude Distillation	1	12.1	12.1	1	1	1
Crude Desalting	2	12.1	12.1	1	1	1
Vacuum Crude Distillation	3	0	12.1	0	1	0
TOTAL CRUDE PROCESSES FEEDSTOCK RATE=		24.2				
CRACKING AND COXING PROCESSES:						
Visbreaking	4	0	12.1	0	6	0
Thermal Cracking	5	0	12.1	0	6	0
Fluid Catalytic Cracking	6	0	12.1	0	6	0
Moving Bed Catalytic Cracking	7	0	12.1	0	6	0
Hydrocracking	10	0	12.1	0	6	0
Delayed Coking	15	0	12.1	0	6	0
Fluid Coking	16	0	12.1	0	6	0
Hydrotreating	54	5.1	Not Applicable to Refinery Process Config. Factor			
TOTAL CRACKING AND COXING PROCESSES FEEDSTOCK RATE=		5.1				
LUBE PROCESSES:						
Hydrofining, Hydrofinishing, Lube Hydrofinishing	21	0	12.1	0	13	0
White Oil Manufacture	22	0	12.1	0	13	0
Propane: Dewaxing, Deasphalting, Fractioning, Deresining	23	0	12.1	0	13	0
Duo Sol. Solvent Treating, Solvent Extraction, Duotreating, Solvent Dewaxing, Solvent Deasphalt	24	0	12.1	0	13	0
Lube Vacuum Tower, Oil Fractionation, Batch Still (Naphtha Strip), Bright Stock Treating	25	0	12.1	0	13	0
Centrifuge and Chilling	26	0	12.1	0	13	0
Dewaxing, MEK, Ketone, MEK-Toluene	27	0	12.1	0	13	0
Deoiling (Wax)	28	0	12.1	0	13	0
Naphthenic Lube Production	29	0	12.1	0	13	0
SO2 Extraction	30	0	12.1	0	13	0
Wax Pressing	34	0	12.1	0	13	0
Wax Plant (with Neutral Separation)	35	0	12.1	0	13	0
Furfural Extracting	36	0	12.1	0	13	0
Clay Contacting - Percolation	37	0	12.1	0	13	0
Wax Sweating	38	0	12.1	0	13	0
Acid Treating	39	0	12.1	0	13	0
Phenol Extraction	40	0	12.1	0	13	0
TOTAL LUBE PROCESS FEEDSTOCK RATE=		0				



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## Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.

## Outfall 002

## Calculation of Unit Process Rates, Unit Configuration, Process and Size Factors

TABLE 2 (continued)

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)
	Unit Process Rate					
	EPA Process Number	Unit Process Rate K bbl/day	Total Feedstock Rate	to Feedstock Ratio *	Unit Process Weighting Factor *	Unit Process Config. Factor
ASPHALT PROCESSES:						
Asphalt Production	18	0	12.1	0	12	0
200 Deg. F Softening Point Unfluxed Asphalt	32	0	Not Applicable to Refinery Process Config. Factor			
Asphalt Oxidizing	43	0	12.1	0	12	0
Asphalt Emulsifying	89	0	12.1	0	12	0
TOTAL ASPHALT PROCESS FEEDSTOCK RATE=		0				
REFORMING AND ALKYLATION PROCESSES:						
H2SO4 Alkylation	8	0	Not Applicable to Refinery Process Config. Factor			
Catalytic Reforming	12	0	Not Applicable to Refinery Process Config. Factor			
TOTAL REFORMING AND ALKYLATION PROCESS FEEDSTOCK RATE=		0				
TOTAL REFINERY PROCESS CONFIGURATION FACTOR=						2

TABLE 3

## PROCESS FACTORS BY SUBPART

Total Refinery Process Configuration	Topping Subpart
	A
< 2.49	0.62
2.5 to 3.49	0.67
3.5 to 4.49	0.8
4.5 to 5.49	0.95
5.5 to 5.99	1.07
6.0 to 6.49	1.17
6.5 to 6.99	1.27
7.0 to 7.49	1.39
7.5 to 7.99	1.51
8.0 to 8.49	1.64
8.5 to 8.99	1.79
9.0 to 9.49	1.95
9.5 to 9.99	2.12
10.0 to 10.49	2.31
10.5 to 10.99	2.51
11.0 to 11.49	2.73
11.5 to 11.99	2.98
12.0 to 12.49	3.24
12.5 to 12.99	3.53
13.0 to 13.49	3.84
13.5 to 13.99	4.18
>=14.00	4.36

TABLE 4

## SIZE FACTORS BY SUBPART

K bbl/day Feedstock (Stream Day)	Topping Subpart
	A
< 24.9	1.02
25.0 to 49.9	1.06
50.0 to 74.9	1.16
75.0 to 99.9	1.26
100.0 to 124.9	1.38
125.0 to 149.9	1.5
150.0 to 174.9	1.57
175.0 to 199.9	1.57
200.0 to 224.9	1.57
>=225.0	1.57

TABLE 5

## PROCESS GROUP FEEDSTOCK RATES:

Process Group:	Feedstock Rate, K bbl/day:
Crude=	24.2
Cracking and Coking=	5.1
Lube=	0
Asphalt=	0
Reforming and Alkylation=	0

## PROCESS FACTOR INPUT:

Refinery Configuration = 2

## SIZE FACTOR INPUT:

Feedstock, K bbl/day = 12.1

## FACTOR REFERENCE

PROCESS FACTOR = 0.62 419.13(b)

SIZE FACTOR = 1.02 419.13(b)

Multiplier = Feedstock \* Process Factor \* Size Factor

Multiplier = 7.65204

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Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.

Outfall 002

Conventional, nonconventional, and toxic refinery pollutant loading calculations

TABLE 6

40 CFR 419, Petroleum and Refining Guidelines

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PROCESS WASTEWATER	REFERENCES:	FACTORS:			Multiplier	LOADINGS:		
		Subpart A	Topping	Topping		Discharge	Topping	Topping
			Subpart	Subpart		Fraction	Subpart	Subpart
			A	A		Through	A	A
PARAMETER	Category: Treatmt.	lb/K bbl	lb/K bbl	lb/K bbl		Outfall	lb/day	lb/day
	Topping	Tech.	Avg	Max			Avg	Max
Conventional:								
BOD5	419.14(a)	BCT	4.25	8	7.65204	1	32.52117	61.21632
TSS	419.14(a)	BCT	3.6	5.6	7.65204	1	27.54734	42.85142
Oil and Grease	419.14(a)	BCT	1.3	2.5	7.65204	1	9.947652	19.1301
Nonconventional:								
COD	419.13(a)	BAT	21.3	41.2	7.65204	1	162.9885	315.264
TOC	---	---	---	---	7.65204	1	---	---
Ammonia	419.13(a)	BAT	0.45	0.99	7.65204	1	3.443418	7.57552
Sulfide	419.13(a)	BAT	0.024	0.053	7.65204	1	0.183649	0.405558

BPT Calculations for Total Recoverable Phenolics, Total Chromium, and Chromium (6+)

Total Phenolics	419.12(a)	BPT	0.027	0.06	7.65204	1	0.206605	0.459122
Chromium (Total)	419.12(a)	BPT	0.071	0.122	7.65204	1	0.543295	0.933549
Chromium (6+)	419.12(a)	BPT	0.0044	0.01	7.65204	1	0.033669	0.07652

BAT Calculations for Total Recoverable Phenolics, Total Chromium, and Chromium (6+)

Table 2

Rate, x bbl/day

Total Phenolics								
Crude Processes	419.13(c)	BAT	0.003	0.013	24.2	1	0.0726	0.3146
Cracking & Coking	419.13(c)	BAT	0.036	0.147	5.1	1	0.1836	0.7497
Asphalt Processes	419.13(c)	BAT	0.019	0.079	---	---	---	---
Lube Processes	419.13(c)	BAT	0.09	0.369	---	---	---	---
Reforming and Alkylation	419.13(c)	BAT	0.032	0.132	---	---	---	---

Total Phenolics BAT: 0.2562 1.0643

Chromium (Total)

Crude Processes	419.13(c)	BAT	0.004	0.011	24.2	1	0.0968	0.2662
Cracking & Coking	419.13(c)	BAT	0.041	0.119	5.1	1	0.2091	0.6069
Asphalt Processes	419.13(c)	BAT	0.022	0.064	---	---	---	---
Lube Processes	419.13(c)	BAT	0.104	0.299	---	---	---	---
Reforming and Alkylation	419.13(c)	BAT	0.037	0.107	---	---	---	---

Total Chromium BAT: 0.3059 0.8731

[illegible]

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Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.

Outfall 002

Conventional, nonconventional, and toxic refinery pollutant loading calculations

TABLE 6 (continued)

40 CFR 419, Petroleum and Refining Guidelines

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)
			Topping	Topping		Discharge	Topping	Topping
			Subpart	Subpart		Fraction	Subpart	Subpart
STORMWATER	Subpart A		A	A		Through	A	A
	Category: Treatmt.		lb/K gal	lb/K gal		Flow Outfall	lb/day	lb/day
PARAMETER	Topping	Tech	Avg	Max	K gal/day		Avg	Max
Conventional								
BOD5	419.14(e)	BCT	0.22	0.4	82	1	18.04	32.8
TSS	419.14(e)	BCT	0.18	0.28	82	1	14.76	22.96
Oil and Grease	419.14(e)	BCT	0.067	0.13	82	1	5.494	10.66
Nonconventional								
COD	419.13(f)	BAT	1.5	3	82	1	123	246
TOC	---	---	---	---	82	1	---	---
Total Phenolics	419.13(f)	BAT	0.0014	0.0029	82	1	0.1148	0.2378
Metals								
Chromium (Total)	419.13(f)	BAT	0.0018	0.005	82	1	0.1476	0.41
Chromium (6+)	419.13(f)	BAT	0.00023	0.00052	82	1	0.01886	0.04264

TABLE 7

TOTAL ALLOCATIONS = Process WW + Ballast Water + Contaminated SW (lbs/day)

	PROCESS WASTEWATER		BALLAST		STORMWATER		TOTAL ALLOCATION	
	(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*9)
	Topping	Topping	Topping	Topping	Topping	Topping	Topping	Topping
	Subpart	Subpart	Subpart	Subpart	Subpart	Subpart	Subpart	Subpart
	A	A	A	A	A	A	A	A
PARAMETER	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Conventional								
BOD5	32.52117	61.21632	---	---	18.04	32.8	50.56117	94.01632
TSS	27.54734	42.85142	---	---	14.76	22.96	42.30734	65.81142
Oil and Grease	9.947652	19.1301	---	---	5.494	10.66	15.44165	29.7901
Nonconventional								
COD	162.9885	315.264	---	---	123	246	285.9885	561.264
TOC	---	---	---	---	---	---	---	---
Ammonia	3.443418	7.57552	---	---	---	---	3.443418	7.57552
Sulfide	0.183649	0.405558	---	---	---	---	0.183649	0.405558
Total Phenolics	0.206605	0.459122	---	---	0.1148	0.2378	0.321405	0.696922
Metals								
Chromium (Total)	0.3059	0.8731	---	---	0.1476	0.41	0.4535	1.2831
Chromium (6+)	0.0246	0.0557	---	---	0.01886	0.04264	0.04346	0.09834

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 Calculation of Technology Based Limits for Calumet Lubricants Company, L.P.  
 Outfall 002  
 Anti-Backsliding Screening  
 TABLE 8

Anti-Backsliding Calculations, 40 CFR 122.44(i)(1), LAC 33.IX.2361.L

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)	(*10)
G/L Val	G/L Val	Tech Old	Tech Old	Antiback	Outfall 002	Outfall 002	Outfall 002	Outfall 002	Outfall 002
Avg	Max	Avg	Max	0=no scr.	Avg	Max	Avg	Max	
lb/day	lb/day	lb/day	lb/day	1=Old vs GL	lb/day	lb/day	mg/L	mg/L	
PARAMETER				2=Old+GL					
Conventional:									
BOD5	50.56117	94.01632	30	56	1	30	56	---	---
TSS	42.30734	65.81142				42	66	---	---
Oil and Grease	15.44165	29.7901				15	30	---	---
Nonconventional:									
COD	285.9885	561.264	149	288	1	149	288	---	---
TOC	---	---			---	---	---	---	---
Ammonia	3.443418	7.57552	3.1	6.9	1	3	7	---	---
Sulfide	0.183649	0.405558			---	0.2	0.4	---	---
Total Phenolics	0.321405	0.696922			---	0.3	0.7	---	---
Metals:									
Chromium (Total)	0.4535	1.2831			---	0.5	1.3	---	---
Chromium (6+)	0.04346	0.09834			---	0.0	0.1	---	---

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**Technology Spreadsheet Documentation**

APPENDIX A-2  
LA0005312 / AI No. 312

Documentation and Explanation of Technology Calculations  
and Associated Lotus Spreadsheet

This is a technology spreadsheet covering the effluent guidelines for petroleum refining, 40 CFR 419. The refinery guidelines consists of 5 Subparts; Subpart A-Topping, Subpart B-Cracking, Subpart C-Petrochemical, Subpart D-Lube, and Subpart E-Integrated. Treatment technologies consist of Best Available Technology Economically Achievable (BAT), Best Conventional Technology (BCT), and Best Practicable Control Technology Currently Available (BPT). For most effluent guidelines with toxic and non-conventional pollutants, BAT represents the most stringent guideline and the one that is used in most permitting applications. However, in refinery guidelines there are cases where BPT or BCT is sometimes more stringent than BAT and these limitations are applied to the parameter of concern. BCT is used for conventional pollutants. The final calculations are screened against limitations established in a previous permit by BPJ. These limitations are now BAT for that facility and must be screened against the calculated effluent guideline limitations with the most stringent applying in order to address anti-backsliding concerns (40 CFR 122.44.1, LAC 33.IX.2707.L). The term "Daily Average" as it is used in this documentation and in the spreadsheet is assumed to be equivalent to "Monthly Average". The spreadsheet is set up in a table and column/section format. Each table represents a general category for data input or calculation points. Each reference column or section is marked by a set of parentheses enclosing a number and asterisk, for example (\*1) or (\*8). These columns or sections represent inputs, existing data sets, calculation points, or results for determining technology based limits for an effluent of concern.

**Introductory Notes to Petroleum Refining Effluent Limitations Calculations:**

Regulatory Basis

Unless otherwise stated, the technology-based permit effluent limitations presented in this appendix are calculated using national effluent limitations and standards listed at 40 CFR Part 419 - Petroleum Refining Point Source Category. Technical data supporting the national effluent limitations and standards for the Petroleum Refining Point Source Category will be found at the following development documents:

1974 Development Document

Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category, USEPA, EPA-44011-74-014a, April 1974

1982 Development Document

Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category, USEPA, EPA 440/1-82/014, October 1982

Example Calculations

Example calculations for deriving petroleum refining permit effluent limitations will be found at:

## Appendix A-2

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40 CFR

Part 419.42(a) (3)

Part 419.43(c) (2)

Development Documents

1974 Development Document (Section IX, Pages 148-151)

1982 Development Document (Section I, Pages 1-14)

1985 Guidance

Guide for the Application of Effluent Limitations Guidelines for the  
 Petroleum Refining Industry, USEPA, Industrial Technology Division, June  
 1985

Discussion of EPA Refining Processes Used in Calculations

	EPA Process Number
<u>Crude Processes</u>	
Atmospheric Crude Distillation	1
Crude Desalting	2
Vacuum Crude Distillation	3
 <u>Cracking and Coking Processes</u>	
Visbreaking	4
Thermal Cracking	5
Fluid Catalytic Cracking	6
Moving Bed Catalytic Cracking	7
Hydrocracking	10
Delayed Coking	15
Fluid Coking	16
Hydrotreating*	54
 <u>Lube Processes</u>	
Hydrofining, Hydrofinishing, Lube Hydrofinishing	21
White Oil Manufacture	22
Propane: Dewaxing, Deasphalting, Fractioning, Derinsing	23
Duo Sol, Solvent Treating, Solvent Extraction	24
Duotreating, Solvent Dewaxing, Solvent Deasphalt	
Lube Vacuum Tower, Oil Fractionation, Batch Still (Naphtha Strip), Bright Stock Treating	25
Centrifuge & Chilling	26
Dewaxing: MEK, Ketone, MEK-Toluene	27
Deoiling (Wax)	28
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- \* These processes are not included in the refinery process configuration factor calculations.

EPA Process Numbers will be found at Appendix A to 40 CFR 419. They can be cross-referenced in Table III-7, pages 49-54 of the 1982 Development Document.

Refining processes used in Table 2 (except as noted) lead to the calculation of all BPT/BCT permit effluent limitations for ammonia (as N), sulfide (as S), and COD only. The Table 2 refining processes are listed at Section IX, Table 51, page 151, of the 1974 Development Document. A detailed discussion of the refining processes used in the refinery process configuration factor (Table 2) is found in the "1974" Flow Model at Section IV, pages 55-62, of the 1974 Development Document and at Section IV, pages 63-65 of the 1982 Development Document. Also see "Process Groupings Included in 1974 Flow Model" at page 19 of the 1985 Guidance. Because certain petroleum refining processes [Hydrotreating; 200 Deg. F Softening Point Unfluxed Asphalt; H<sub>2</sub>SO<sub>4</sub> Alkylation; and Catalytic Reforming] were not included in the 1974 flow model, they are not included as a process in the refinery process configuration factor calculations (Table 2). In 1976, the U.S. Court of Appeals upheld the 1974 BPT and NSPS regulations [see discussion at Section IV, pages 61-62, of the 1982 Development Document]. Refining processes not included in the 1974 Flow Model [the basis for all BPT/BCT permit effluent limitations and BAT permit effluent limitations for ammonia (as N), sulfide (as S), and COD only] are not considered in the refinery process configuration factor calculations (Table 2).

Refining processes and categories used in Tables 2 and 5 lead to the calculation of amended BAT permit effluent limitations for total recoverable phenolics, chromium (total), and chromium (6+). These refining processes are listed at Appendix A to 40 CFR Part 419. A detailed discussion of the refining processes used in BAT permit effluent limit calculations will be

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found in the discussion of the Refined Flow Model at Section IV, pages 67-68, of the 1982 Development Document. Also see "Process Groupings Included in 1979 Flow Model" at page 20 of the 1985 Guidance. Refining processes not included in the 1979 Flow Model [the basis for Appendix A to 40 CFR Part 419] are not considered in BAT permit effluent limitations for total recoverable phenolics, chromium (total), and chromium (6+).

Organizations or individuals desiring the inclusion of other refining processes in the previously mentioned calculations should petition the U.S. Environmental Protection Agency under the Administrative Procedures Act, 5-U.S.C. Sec. 553(e), which authorizes interested parties to petition the issuance, amendment, or repeal of a rule.

Table 1

Table 1 is a data input area.

## (\*1) Facility Information

Generalized input information for the facility:

Permittee- Permittee name.

Permit Number- LPDES permit number.

Concentration flow, (MGD)- If concentration limits are desired, then a flow for determining concentration limits is placed here.

Anti-backsliding, GL vs Old, 0=n, 1=y, 2=GL+Old: This switch establishes how previously established Best Professional Judgement (BPJ) permit limits will be screened. "0" indicates that no screening will occur. "1" indicates that the BPJ-Technology permit limits will be screened. "2" indicates that the guideline values will be added to the previously established BPJ-Technology limitations. This is only used when significant increases in production have occurred since the last permit was issued. Guideline values are calculated only on the basis of the increase.

Outfall number: Generally written as an abbreviation, e.g., "Out. 001".

40 CFR 419 Subpart, (A, B, C, D, or E): The subpart that the spreadsheet uses is specified by putting the designated subpart letter in the indicated cell. Input can be in either lower case or upper case.

Refinery type: The spreadsheet automatically specifies the refinery type, Topping, Cracking, Petrochemical, Lube, or Integrated based on the subpart specified.

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## (\*2) Throughput Rates

Feedstock (Crude Oil and NGL) Rate to Topping Unit(s): As defined in the guidelines, the term "feedstock" shall mean the crude oil and natural gas liquids (NGL) fed to the topping unit(s).

Process Unit Rates: These values are input in Table 2 on the row indicating the specific process under the column labeled, "Unit Process Rate K bbl/day."

## (\*3) Flow Rates

Ballast Flow, K gal/day: As defined in the guidelines, "ballast" shall mean the flow of waters, from a ship, that is treated along with refinery wastewaters in the main treatment system. Units as specified.

Stormwater Calculations: The refinery effluent guidelines give an allowance for contaminated runoff. This is calculated using an areal estimate of the process area in either square feet or acres and an annual rainfall estimate in inches.

Process area, sq. ft. (or acres): The process area size is specified in the cell with the appropriate units.

Annual rainfall, inches: Estimate of annual rainfall as specified.

Contaminated stormwater to Treatment System: Input here is optional. This is the calculated value utilizing the process area size and amount of rainfall specified above or a precalculated value (from DMR's or other sources) submitted by the applicant. If you are utilizing a precalculated value, then inputs in the Process area, sq. ft. (or acres): or Annual rainfall, inches: fields are not necessary.

(\*4) TOC:BOD5. TOC to BOD5 Ratio. A TOC to BOD5 ratio of 2.2 to 1 is established on a BPJ basis consistent with EPA Region 6 and the refinery effluent guidelines. COD:BOD5 1=y default G/L calculated values for san. This field is used and will appear only when a sanitary allocation to process wastewaters is being calculated. A "1" placed in this field will take the default COD:BOD5 ratio calculated from the total loadings of COD and BOD5 from the refinery guidelines.

(\*5) Discharge fraction, default =1: If the process wastewater is not discharged at 100% through the regulated outfall, then the fraction that is discharged through the regulated outfall is placed here. Examples where a facility may split a process flow include, deep well injection, POTW's, other facilities, etc. This is in accordance with 40 CFR 122.50/LAC 33:IX.2717.

(\*6) Sanitary Flow, MGD: On rare occasions sanitary wastewaters are given a flow allocation in MGD. This allocation will be given only to

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facilities that currently have significant sanitary wastewaters included in their process wastewater BOD5 and TSS allocations. "Significant", in this case, is defined when the sanitary wastewaters contribute 5% or more of the total BOD5 or TSS loading of the wastewater treatment system. This allocation will not be given to facilities that have not received this allocation before or facilities adding additional sanitary wastewaters to their process wastewater treatment systems in accordance with anti-backsliding regulations (40 CFR 122.44.1, LAC 33.IX.2707.L). This section will not appear if sanitary wastewater is not granted an allocation.

## (\*6), (\*7) Anti-backsliding Information:

The previous permit limitations established by BPJ (now BAT) are put under the appropriate column (\*A) "Avg" for daily maximum 30-day average, and (\*B) "Max" for daily maximum on the row with the specified parameter. Column (\*C) utilizes the same switches described in section (\*1) under the discussion on anti-backsliding. The only difference here is that the switch can be specified on a parameter specific basis. If sanitary wastewater is granted an allocation, this will become section (\*7), otherwise it will remain section (\*6).

## (\*7), (\*8) Conversion Utilities:

This section contains useful conversions for calculations throughout the spreadsheet. A section is dedicated to calculating COD:BOD5 ratios or inputting COD concentrations in mg/L for the exclusive purpose of calculating COD loadings attributed to sanitary wastewater. As stated above under section (\*4), default COD:BOD5 ratios are calculated by dividing total guideline COD loading by total guideline BOD5 loading. The use of a more stringent ratio or concentration in a previously issued permit would preclude using the default calculation procedure. All fields containing information about COD ratios or concentrations will not appear if sanitary wastewaters are not granted an allocation for BOD5. If sanitary wastewater is granted an allocation, this will become section (\*8), otherwise it will remain section (\*7).

Table 2

Table 2 calculates the total refinery process configuration factor by summing all contributing unit process configuration factors (except processes noted).

- (\*1) Specifies refinery processes under 5 different categories, crude processes, cracking and coking processes, lube processes, asphalt processes, and reforming and alkylation processes. Footnoted processes are not included in the total refinery process configuration factor.
- (\*2) EPA process number. From Table III-7, Pages 49-54, Final Development Document for Effluent Limitations Guidelines and Standards for the

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Petroleum Refining Point Source Category, EPA 440/1-82/014, October, 1982.

- (\*3) Unit Process Rate, K bbl/day. Process rate is placed on the row with the specified process. Unit process rates are summed for each process group for use in determining BAT limitations for Total Chromium, Chromium (6+), and Total Recoverable Phenolics in Table 6.
- (\*4) Total Feedstock Rate, K bbl/day. This column contains the value specified in section (\*2) of Table 1.
- (\*5) Unit Process Rate to Feedstock Rate Ratio. The unit process rate is divided by the feedstock rate specified in column (\*4).
- (\*6) Weighting factor. The spreadsheet uses the weighting factors specified at 40 CFR 419.42(b)(3), Subpart D.
- (\*7) Unit process configuration factor. The product in this column is the result of multiplying the "Unit Process Rate to Feedstock Rate Ratio" in column (\*5) times the weighting factor specified in column (\*6). These values are summed to obtain the total refinery process configuration factor.

## Tables 3 and 4

Tables 3 and 4 calculate the process and size factors respectively. The input for determining the appropriate process factor is the total refinery process configuration factor. The input for determining the appropriate size factor is the feedstock in K bbl/day. The multiplier used in determining mass loadings for certain parameters specified in Table 6 is determined by multiplying the feedstock times the process factor times the size factor.

## Table 5

Table 5 summarizes the process group feedstock rates (crude, cracking and coking, lube, asphalt, reforming and alkylation) specified in Table 2 for use in calculating BAT limitations for Total Recoverable Phenolics (specified as Total Phenolics), Total Chromium, and Chromium (6+) in Table 6.

## Table 6

Table 6 is where mass loadings are calculated for each parameter under each applicable wastewater type; process, ballast, stormwater (contaminated) and sanitary wastewaters, when applicable. For Total Recoverable Phenolics (specified as Total Phenolics), Total Chromium, and Chromium (6+), mass loadings are calculated twice under the process wastewater section, once with BPT factors and once with BAT factors with the most stringent applying.

- (\*1) Parameter.

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- (\*2) References. 40 CFR reference applicable to the specified factors and subparts in columns (\*4) and (\*5).
- (\*3) Treatmt. Tech. Applicable treatment technology, BPT, BCT, or BPT, for the parameter and factors specified. BPJ is applied to sanitary wastewaters, when sanitary wastewater is granted an allocation.
- (\*4) Factor, Avg. Daily average (daily maximum 30-day average) factors specified in the guidelines. Sanitary wastewater would be granted a flow based allocation of 30 mg/L for BOD<sub>5</sub> and TSS, when applicable.
- (\*5) Factor, Max. Daily maximum factors specified in the guidelines. Sanitary wastewater would be granted a flow based allocation of 45 mg/L for BOD<sub>5</sub> and TSS, when applicable.
- (\*6) Multiplier/Table 2 Group Feedstock Rate, K bbl/day/Flow K gal/day. For the process wastewater, this column contains the multiplier calculated under Tables 3 and 4 or the applicable group feedstock rate from Table 2 in 1000 barrels per day (K bbl/day). For ballast, sanitary (when applicable), and stormwater, flow in 1000 gallons per day (except sanitary in MGD) from the data input table, Table 1.
- (\*7) Discharge fraction through outfall. This column contains the factor calculated in section (\*5) of Table 1.
- (\*8) Daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter under the specified subpart.
- (\*9) Daily maximum loadings in lbs per day for the specified parameter under the specified subpart.

Table 7

Table 7 is a data summary table totaling the allocations from process wastewater, ballast water, contaminated stormwater, and sanitary wastewater (when applicable). The total values represent the refinery effluent guideline limitations.

- (\*1) Process wastewater daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter under the specified subpart.
- (\*2) Process wastewater daily maximum loadings in lbs per day for the specified parameter under the specified subpart.
- (\*3) Ballast water daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter under the specified subpart.
- (\*4) Ballast water daily maximum loadings in lbs per day for the specified parameter under the specified subpart.

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- (\*5) Contaminated stormwater daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter under the specified subpart.
- (\*6) Contaminated stormwater daily maximum loadings in lbs per day for the specified parameter under the specified subpart.
- (\*7) Sanitary wastewater daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter. This column will not appear if sanitary wastewater is not granted an allocation.
- (\*8) Sanitary wastewater daily maximum loadings in lbs per day for the specified parameter. This column will not appear if sanitary wastewater is not granted an allocation.
- (\*7, \*9) Total daily average (daily maximum 30-day average) loadings in lbs per day for the specified parameter under the specified subpart. If sanitary wastewater is granted an allocation, this will become column (\*9), otherwise it will remain column (\*7).
- (\*8, \*10) Total daily maximum loadings in lbs per day for the specified parameter under the specified subpart. If sanitary wastewater is granted an allocation, this will become column (\*10), otherwise it will remain column (\*7).

Table 8

Table 8 is utilized when anti-backsliding (40 CFR 122.44.1, LAC 33.IX.2707.L) concerns are present. The effluent limitation guideline values are screened against BPJ-Technology values from the previous permit with the most stringent applying.

- (\*1) Parameter.
- (\*2) Daily average effluent limitation guideline in lbs/day from column (\*7) in Table 7.
- (\*3) Daily maximum effluent limitation guideline in lbs/day from column (\*8) Table 7.
- (\*4) Daily Average Tech Old in lbs/day. This column is utilized when an anti-backsliding concern (40 CFR 122.44.1, LAC 33.IX.2707.L) is present. This would be indicated by substantially higher limits (=30% or greater) calculated under guidelines than those previously established in the old permit on a BPJ basis. If the previously issued permit (as applicable) contains limits for the parameter of concern and an anti-backsliding concern is present, the limits from the previously issued permit are placed in this column in lbs/day.
- (\*5) Daily Maximum Tech Old in lbs/day. Similar to (\*7).

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- (\*6) Antiback, 0=no scr., 1=OldvsGL, 2=Old+GL. Anti-Backsliding screening switch. The default is set not to screen. This can be changed under section (\*1) in the data input page. If a screen is conducted, a "1" will appear in this column. The more stringent permit limits will appear in columns (\*7) and (\*8). If the screen indicates that the previously issued permit limit utilizing BPJ-Technology is more stringent and an increase in production has occurred, the technology based limits can be recalculated using guidelines for the increase only. This will be indicated by a "2" in this column. The recalculated guideline limitations in columns (\*2) and (\*3) are subsequently added to the values in columns (\*4) and (\*5) yielding technology-based effluent limitations in columns (\*7) and (\*8). The values in this column can be changed on a row-by-row basis for site-specific screening situations.
- (\*7) Daily Average technology based effluent limit in lbs/day. If no anti-backsliding screening is conducted then the value in this column will be equal to the value in column (\*2). When anti-backsliding screening is used, see discussion for column (\*6).
- (\*8) Daily Maximum technology based effluent limit in lbs/day. If no anti-backsliding screening is conducted then the value in this column will be equal to the value in column (\*3). When anti-backsliding screening is used, see discussion for column (\*6).
- (\*9) Daily Average technology based effluent limit in mg/L. A concentration limit can be calculated using the specified concentration flow from section (\*1) under the data input table and the mass limitation calculated under column (\*7). The formula is as follows:
- $$\frac{\text{effluent limit, lbs/day}}{\text{flow, MGD} * 8.34}$$
- (\*10) Daily Maximum technology based effluent limit in mg/L. Similar to column (\*9), a concentration limit can be calculated using the specified concentration flow from section (\*1) under the data input table and the mass limitation calculated under column (\*8). The formula is as follows:
- $$\frac{\text{effluent limit, lbs/day}}{\text{flow, MGD} * 8.34}$$



# **Appendix B**

## **Water Quality Spreadsheet and Documentation**

# **B-1**

## **Water Quality Spreadsheet**

LTA h --> WQBL max

## Appendix B-1

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(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)	(*10)	(*11)
TOXIC	Effluent		Effluent	Effluent		95th %	Numerical Criteria			HW
Parameters	Instream	/Tech	/Tech	1-No	95%	estimate	Acute	Chronic	HHBW	Carcinogen
	Conc.	(Avg)	(Max)	0-95 %	Non-Tech		FW	FW	Indicator	
	ug/L	lbs/day	lbs/day	ug/L	lbs/day		ug/L	ug/L	ug/L	"C"
NONCONVENTIONAL										
Total Phenols (4AAP)		0.3	0.7	5	1		700	350	50	
3-Chlorophenol				10						
4-Chlorophenol				10			383	192		
2,3-Dichlorophenol				10						
2,5-Dichlorophenol				10						
2,6-Dichlorophenol				10						
3,4-Dichlorophenol				10						
2,4-Dichlorophenoxy-										
acetic acid (2,4-D)				---						
2-(2,4,5-Trichlorophen-										
oxy) propionic acid										
(2,4,5 TP, Silvex)				---						
METALS AND CYANIDE										
Total Arsenic		0.0066		10	0	0.014058	596.3194	263.2369		
Total Cadmium				1			29.95453	1.562749		
Chromium III		0.5	1.3	10	1		845.8171	274.3743		
Chromium VI		0.043	0.098	10	1		15.712	10.582		
Total Copper		0.005		10	0	0.01065	13.07716	9.840949		
Total Lead				5			68.61204	2.673713		
Total Mercury				0.2			5.710286	0.039518		
Total Nickel		0.016		40	0	0.03408	883.1311	98.07879		
Total Zinc		0.014		20	0	0.02982	108.8948	99.43749		
Total Cyanide				20			45.9	5.4	12844	
DIOXIN										
2,3,7,8 TCDD; dioxin				0.00001					7.2E-007	C
VOLATILE COMPOUNDS										
Benzene				10			2249	1125	12.5	C
Bromoform				10			2930	1465	34.7	C
Bromodichloromethane				10					3.3	C
Carbon Tetrachloride				10			2730	1365	1.2	C
Chloroform				10			2890	1445	70	C
Dibromochloromethane				10					5.08	C
1,2-Dichloroethane				10			11800	5900	6.8	C
1,1-Dichloroethylene				10			1160	580	0.58	C
1,3-Dichloropropylene				10			606	303	162.79	
Ethylbenzene				10			3200	1600	8100	
Methyl Chloride				50			55000	27500		
Methylene Chloride				20			19300	9650	87	C
1,1,2,2-Tetrachloro-										
ethane				10			932	466	1.8	C

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Calumet Lubricant Company, L.P.

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(*1) Toxic Parameters	(*12) WLAa Acute	(*13) WLAc Chronic	(*14) WLAh HHNDW	(*15) LTAA Acute	(*16) LTAc Chronic	(*17) LTAh HHNDW	(*18) Limiting A,C,HH	(*19) WQBL Avg	(*20) WQBL Max	(*21) WQBL Avg	(*22) WQBL Max	(*23) Need WQBL?
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
<b>NONCONVENTIONAL</b>												
Total Phenols (4AAP)	707.5402	387.7008	55.38583	226.4129	205.4814	55.38583	55.38583	55.38583	131.8183	0.277151	0.659619	yes
3-Chlorophenol	---	---	---	---	---	---	---	---	---	---	---	no
4-Chlorophenol	387.1255	212.6816	---	123.8802	112.7212	---	112.7212	147.6648	350.5631	0.738915	1.754218	no
2,3-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	---	no
2,5-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	---	no
2,6-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	---	no
3,4-Dichlorophenol	---	---	---	---	---	---	---	---	---	---	---	no
2,4-Dichlorophenoc- acetic acid (2,4-D)	---	---	---	---	---	---	---	---	---	---	---	no
2-(2,4,5-Trichlorophen- oxy) propionic acid (2,4,5-TP, Silvex)	---	---	---	---	---	---	---	---	---	---	---	no
<b>METALS AND CYANIDE</b>												
Total Arsenic	602.7427	291.5919	---	192.8777	154.5437	---	154.5437	202.4523	480.631	1.013071	2.405077	no
Total Cadmium	30.27719	1.731083	---	9.688702	0.917474	---	0.917474	1.201891	2.853345	0.006014	0.014278	no
Chromium III	854.9279	303.929	---	273.5769	161.0824	---	161.0824	211.0179	500.9662	1.055934	2.506835	no
Chromium VI	15.88124	11.72166	---	5.081998	6.212585	---	5.081998	6.657418	15.80501	0.033314	0.079088	yes
Total Copper	13.21803	10.90098	---	4.229769	5.777521	---	4.229769	5.540997	13.15458	0.027727	0.065826	no
Total Lead	69.35111	2.961716	---	22.19235	1.56971	---	1.56971	2.05632	4.881797	0.01029	0.024429	no
Total Mercury	5.771795	0.043774	---	1.846974	0.0232	---	0.0232	0.030392	0.072153	0.000152	0.000361	no
Total Nickel	892.6439	108.6435	---	285.646	57.58106	---	57.58106	75.43119	179.0771	0.377458	0.896102	no
Total Zinc	110.0678	110.1486	---	35.2217	58.37874	---	35.2217	46.14042	109.5395	0.230887	0.548136	no
Total Cyanide	46.39442	5.98167	14227.51	14.84621	3.170285	14227.51	3.170285	4.153073	9.859587	0.020782	0.049337	no
<b>DIOXIN</b>												
2,3,7,8 TCDD; dioxin	---	---	0.000001	---	---	0.000001	0.000001	0.000001	0.000004	7.5E-009	1.8E-008	no
<b>VOLATILE COMPOUNDS</b>												
Benzene	2273.225	1246.181	25.96458	727.4322	660.4761	25.96458	25.96458	25.96458	61.79571	0.129927	0.309226	no
Bromoform	2961.561	1622.805	72.07768	947.6995	860.0866	72.07768	72.07768	72.07768	171.5449	0.360677	0.858411	no
Bromodichloromethane	---	---	6.85465	---	---	6.85465	6.85465	6.85465	16.31407	0.034301	0.081636	no
Carbon Tetrachloride	2759.407	1512.033	2.4926	883.0101	801.3776	2.4926	2.4926	2.4926	5.932388	0.012473	0.029686	no
Chloroform	2921.13	1600.651	145.4017	934.7616	848.3448	145.4017	145.4017	145.4017	346.056	0.72759	1.731664	no
Dibromochloromethane	---	---	10.55201	---	---	10.55201	10.55201	10.55201	25.11378	0.052802	0.125669	no
1,2-Dichloroethane	11927.11	6535.528	14.12473	3816.674	3463.83	14.12473	14.12473	14.12473	33.61687	0.07068	0.168219	no
1,1-Dichloroethylene	1172.495	642.4757	1.204757	375.1984	340.5121	1.204757	1.204757	1.204757	2.867321	0.006029	0.014348	no
1,3-Dichloropropylene	612.5276	335.6382	180.3252	196.0088	177.8882	180.3252	177.8882	233.0336	553.2324	1.1661	2.768375	no
Ethylbenzene	3234.469	1772.347	8972.505	1035.03	939.3437	8972.505	939.3437	1230.54	2921.359	6.157624	14.61848	no
Methyl Chloride	55592.44	30462.21	---	17789.58	16144.97	---	16144.97	21149.91	50210.86	105.8342	251.2551	no
Methyl Chloride	19507.89	10689.47	180.7135	6242.526	5665.417	180.7135	180.7135	180.7135	430.0981	0.90429	2.152211	no
1,1,2,2-Tetrachloro- ethane	942.0392	516.196	3.7389	301.4525	273.5839	3.7389	3.7389	3.7389	8.898582	0.018709	0.044529	no

[illegible]

(*1)	(*12)	(*13)	(*14)	(*15)	(*16)	(*17)	(*18)	(*19)	(*20)	(*21)	(*22)	(*23)
Toxic Parameters	WLAa	WLAc	WLAh	LTAa	LTAc	LTAh	Limiting	WQBL	WQBL	WQBL	WQBL	
	Acute	Chronic	HHNDW	Acute	Chronic	HHNDW	A, C, HH	Avg	Max	Avg	Max	Need
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
Tetrachloroethylene	1303.895	714.4773	5.192917	417.2465	378.6729	5.192917	5.192917	5.192917	12.35914	0.025985	0.061845	no
Toluene	1283.68	703.4001	51176.51	410.7776	372.802	51176.51	372.802	488.3707	1159.414	2.443807	5.801709	no
1,1,1-Trichloroethane	5336.874	2924.372	---	1707.8	1549.917	---	1549.917	2030.391	4820.242	10.16008	24.12049	no
1,1,2-Trichloroethane	1819.389	996.945	14.33245	582.2045	528.3809	14.33245	14.33245	14.33245	34.11123	0.07172	0.170693	no
Trichloroethylene	3942.01	2160.048	43.6205	1261.443	1144.825	43.6205	43.6205	43.6205	103.8168	0.218277	0.519499	no
Vinyl Chloride	---	---	74.36257	---	---	74.36257	74.36257	74.36257	176.9829	0.37211	0.885622	no
ACID COMPOUNDS												
2-Chlorophenol	260.7791	142.8955	140.0154	83.44931	75.73459	140.0154	75.73459	99.21231	235.5346	0.496458	1.178615	no
2,4-Dichlorophenol	204.1759	111.8794	257.6549	65.33628	59.29607	257.6549	59.29607	77.67786	184.4108	0.3887	0.922792	no
BASE NEUTRAL COMPOUNDS												
Benidine	252.6929	138.4646	0.000353	80.86173	73.38623	0.000353	0.000353	0.000353	0.00084	0.000002	0.000004	no
Hexachlorobenzene	---	---	0.000519	---	---	0.000519	0.000519	0.000519	0.001236	0.000003	0.000006	no
Hexachlorabutadiene	5.154936	1.129871	0.228488	1.649579	0.598832	0.228488	0.228488	0.228488	0.543802	0.001143	0.002721	no
PESTICIDES												
Aldrin	3.032315	---	0.000831	0.970341	---	0.000831	0.000831	0.000831	0.001977	0.000004	0.00001	no
Hexachlorocyclohexane (gamma BHC, Lindane)	5.35709	0.232621	0.415433	1.714269	0.123289	0.415433	0.123289	0.161508	0.383428	0.000808	0.001919	no
Chlordane	2.425852	0.004763	0.000395	0.776273	0.002524	0.000395	0.000395	0.000395	0.000939	0.000002	0.000005	no
4,4'-DDT	1.111849	0.001108	0.000395	0.355792	0.000587	0.000395	0.000395	0.000395	0.000939	0.000007	0.000005	no
4,4'-DDE	53.06551	11.63103	0.000395	16.98096	6.164443	0.000395	0.000395	0.000395	0.000939	0.000002	0.000005	no
4,4'-DDD	0.030323	0.006646	0.000561	0.009703	0.003523	0.000561	0.000561	0.000561	0.001335	0.000003	0.000007	no
Dieldrin	0.239957	0.0617	0.000104	0.076786	0.032701	0.000104	0.000104	0.000104	0.000247	5.2E-007	0.000001	no
Endosulfan	0.22237	0.062032	0.708939	0.071158	0.032877	0.708939	0.032877	0.043069	0.102248	0.000216	0.000512	no
Endrin	0.087331	0.041539	0.288006	0.027946	0.022016	0.288006	0.022016	0.028841	0.068469	0.000144	0.000343	no
Heptachlor	0.525601	0.004209	0.000145	0.168192	0.002231	0.000145	0.000145	0.000145	0.000346	7.3E-007	0.000002	no
Toxaphene	0.737863	0.000222	0.000499	0.236116	0.000117	0.000499	0.000117	0.000154	0.000365	7.7E-007	0.000002	no
Other Parameters:												
Fecal Col. (col/100ml)	---	---	---	---	---	---	---	---	---	---	---	no
Chlorine	19.20466	12.18488	---	6.145492	6.457988	---	6.145492	8.050594	19.11248	0.040285	0.095639	no
Ammonia	---	---	---	---	---	---	---	---	---	---	---	no
Chlorides	---	---	---	---	---	---	---	---	---	---	---	no
Sulfates	---	---	---	---	---	---	---	---	---	---	---	no
DS	---	---	---	---	---	---	---	---	---	---	---	no
	---	---	---	---	---	---	---	---	---	---	---	no
	---	---	---	---	---	---	---	---	---	---	---	no

## **B-2**

### **Water Quality Spreadsheet Documentation**



## APPENDIX B-2, AI No.312

Documentation and Explanation of Water Quality Screen  
and Associated Lotus Spreadsheet

Each reference column is marked by a set of parentheses enclosing a number and asterisk, for example (\*1) or (\*19). These columns represent inputs, existing data sets, calculation points, and results for determining Water Quality Based Limits for an effluent of concern. The following represents a summary of information used in calculating the water quality screen:

## Receiving Water Characteristics:

Receiving Water: Bayou Dorcheat via French Creek, Dry Creek and Davis Slough

Critical Flow, Qrc (cfs): 0.1  
 Harmonic Mean Flow, Qrh (cfs): 1.0  
 Segment No.: 100501  
 Receiving Stream Hardness (mg/L): 25.12  
 Receiving Stream TSS (mg/L): 5.35  
 MZ Stream Factor, Fs: 1.0  
 Plume distance, Pf: N/A

## Effluent Characteristics:

Company: Calumet Lubricants Company, L.P.  
 Facility flow, Qe (MGD): 0.6  
 Effluent Hardness: N/A  
 Effluent TSS: N/A  
 Pipe/canal width, Pw: N/A  
 Permit Number: LA0005312.

## Variable Definition:

Qrc, critical flow of receiving stream, cfs  
 Qrh, harmonic mean flow of the receiving stream, cfs  
 Pf = Allowable plume distance in feet, specified in LAC 33:IX.1115.D  
 Pw = Pipe width or canal width in feet  
 Qe, total facility flow, MGD  
 Fs, stream factor from LAC.33.IX Chapter 11 (1 for harmonic mean flow)  
 Cu, ambient concentration, ug/L  
 Cr, numerical criteria from LAC.33.IX.1113, Table 1  
 WLA, wasteload allocation  
 LTA, long term average calculations  
 WQBL, effluent water quality based limit  
 ZID, Zone of Initial Dilution in % effluent  
 MZ, Mixing Zone in % effluent

Formulas used in aquatic life water quality screen (dilution type WLA):

## Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 \times F_s + Q_e)}$$

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$$\text{WLA a,c,h} = \frac{\text{Cr}}{\text{Dilution Factor}} - \frac{(\text{Fs} \times \text{Qrc} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Static water bodies (in the absence of a site specific dilution):

Discharge from a pipe:

Discharge from a canal:

Critical

$$\text{Dilution} = \frac{(2.8) \text{ Pw } \pi^{1/2}}{\text{Pf}}$$

Critical

$$\text{Dilution} = \frac{(2.38) (\text{Pw}^{1/2})}{(\text{Pf})^{1/2}}$$

$$\text{WLA} = \frac{(\text{Cr}-\text{Cu}) \text{ Pf}}{(2.8) \text{ Pw } \pi^{1/2}}$$

$$\text{WLA} = \frac{(\text{Cr}-\text{Cu}) \text{ Pf}^{1/2}}{2.38 \text{ Pw}^{1/2}}$$

Formulas used in human health water quality screen, human health non-carcinogens (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{\text{Qe}}{(\text{Qrc} \times 0.6463 + \text{Qe})}$$

$$\text{WLA a,c,h} = \frac{\text{Cr}}{\text{Dilution Factor}} - \frac{(\text{Qrc} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Formulas used in human health water quality screen, human health carcinogens (dilution type WLA):

$$\text{Dilution Factor} = \frac{\text{Qe}}{(\text{Qrh} \times 0.6463 + \text{Qe})}$$

$$\text{WLA a,c,h} = \frac{\text{Cr}}{\text{Dilution Factor}} - \frac{(\text{Qrh} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Static water bodies in the absence of a site specific dilution (human health carcinogens and human health non-carcinogens):

Discharge from a pipe:

Discharge from a canal:

Critical

$$\text{Dilution} = \frac{(2.8) \text{ Pw } \pi^{1/2}}{\text{Pf}}$$

Critical

$$\text{Dilution} = \frac{(2.38) (\text{Pw}^{1/2})}{(\text{Pf})^{1/2}}$$

$$\text{WLA} = \frac{(\text{Cr}-\text{Cu}) \text{ Pf}^*}{(2.8) \text{ Pw } \pi^{1/2}}$$

$$\text{WLA} = \frac{(\text{Cr}-\text{Cu}) \text{ Pf}^{1/2}*}{2.38 \text{ Pw}^{1/2}}$$

\* Pf is set equal to the mixing zone distance specified in LAC 33:IX.1115 for the static water body type, i.e., lake, estuary, Gulf of Mexico, etc.

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If a site specific dilution is used, WLA are calculated by subtracting Cu from Cr and dividing by the site specific dilution for human health and aquatic life criteria.

$$WLA = \frac{(Cr - Cu)}{\text{site specific dilution}}$$

## Long Term Average Calculations:

$$LTAA = WLAa \times 0.32$$

$$LTAc = WLAc \times 0.53$$

$$LTAh = WLAh$$

## WQBL Calculations:

Select most limiting LTA to calculate daily max and monthly avg WQBL

If aquatic life LTA is more limiting:

$$\text{Daily Maximum} = \text{Min}(LTAA, LTAc) \times 3.11$$

$$\text{Monthly Average} = \text{Min}(LTAc, LTAh) \times 1.31$$

If human health LTA is more limiting:

$$\text{Daily Maximum} = LTAh \times 2.38$$

$$\text{Monthly Average} = LTAh$$

## Mass Balance Formulas:

$$\text{mass (lbs/day)}: (\text{ug/L}) \times 1/1000 \times (\text{flow, MGD}) \times 8.34 = \text{lbs/day}$$

$$\text{concentration(ug/L)}: \frac{\text{lbs/day}}{(\text{flow, MGD}) \times 8.34 \times 1/1000} = \text{ug/L}$$

The following is an explanation of the references in the spreadsheet.

- (\*1) Parameter being screened.
- (\*2) Instream concentration for the parameter being screened in ug/L. In the absence of accurate supporting data, the instream concentration is assumed to be zero (0).
- (\*3) Monthly average effluent or technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (\*4) Daily maximum technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (\*5) Minimum analytical Quantification Levels (MQLs). Established in a letter dated January 27, 1994 from Wren Stenger of EPA Region 6 to Kilren Vidrine of LDEQ and from the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". The applicant must test for the parameter at a level at least as sensitive as the specified MQL. If this is not done, the MQL becomes the application value for screening purposes if the pollutant is suspected to be present

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on-site and/or in the waste stream. Units are in ug/l or lbs/day depending on the units of the effluent data.

- (\*6) States whether effluent data is based on 95th percentile estimation. A "1" indicates that a 95th percentile approximation is being used, a "0" indicates that no 95th percentile approximation is being used.
- (\*7) 95th percentile approximation multiplier (2.13). The constant, 2.13, was established in memorandum of understanding dated October 8, 1991 from Jack Ferguson of Region 6 to Jesse Chang of LDEQ and included in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". This value is screened against effluent Water Quality Based Limits established in columns (\*18) - (\*21). Units are in ug/l or lbs/day depending on the units of the measured effluent data.
- (\*8) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, acute criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness Dependent Criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(1.1280[\ln(\text{hardness})] - 1.6774)}$
Chromium III	$e^{(0.0190[\ln(\text{hardness})] + 3.6880)}$
Copper	$e^{(0.9422[\ln(\text{hardness})] - 1.3884)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 1.4600)}$
Nickel	$e^{(0.0460[\ln(\text{hardness})] + 3.3622)}$
Zinc	$e^{(0.0473[\ln(\text{hardness})] + 0.8604)}$

Dissolved to Total Metal Multipliers for Freshwater Streams (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
Arsenic	$1 + 0.48 \times \text{TSS}^{-0.73} \times \text{TSS}$
Cadmium	$1 + 4.00 \times \text{TSS}^{-1.13} \times \text{TSS}$
Chromium III	$1 + 3.36 \times \text{TSS}^{-0.93} \times \text{TSS}$
Copper	$1 + 1.04 \times \text{TSS}^{-0.74} \times \text{TSS}$
Lead	$1 + 2.80 \times \text{TSS}^{-0.80} \times \text{TSS}$
Mercury	$1 + 2.90 \times \text{TSS}^{-1.14} \times \text{TSS}$
Nickel	$1 + 0.49 \times \text{TSS}^{-0.57} \times \text{TSS}$
Zinc	$1 + 1.25 \times \text{TSS}^{-0.70} \times \text{TSS}$

Dissolved to Total Metal Multipliers for Marine Environments (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
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Copper	$1 + (10^{4.86} \times \text{TSS}^{-0.72} \times \text{TSS}) \times 10^{-6}$
Lead	$1 + (10^{6.06} \times \text{TSS}^{-0.85} \times \text{TSS}) \times 10^{-6}$
Zinc	$1 + (10^{5.36} \times \text{TSS}^{-0.52} \times \text{TSS}) \times 10^{-6}$

If a metal does not have multiplier listed above, then the dissolved to total metal multiplier shall be 1.

- (\*9) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, chronic criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness dependent criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(0.7852(\ln(\text{hardness})) - 3.4900)}$
Chromium III	$e^{(0.8473(\ln(\text{hardness})) + 0.7614)}$
Copper	$e^{(0.8545(\ln(\text{hardness})) - 1.3860)}$
Lead	$e^{(1.2730(\ln(\text{hardness})) - 4.7050)}$
Nickel	$e^{(0.8460(\ln(\text{hardness})) + 1.1645)}$
Zinc	$e^{(0.8473(\ln(\text{hardness})) + 0.7614)}$

Dissolved to total metal multiplier formulas are the same as (\*8), acute numerical criteria for aquatic life protection.

- (\*10) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, human health protection, drinking water supply (HHDW), non-drinking water supply criteria (HHNDW), or human health non-primary contact recreation (HHNPCR) (whichever is applicable). A DEQ and EPA approved Use Attainability Analysis is required before HHNPCR is used, e.g., Monte Sano Bayou. Units are specified.
- (\*11) C if screened and carcinogenic. If a parameter is being screened and is carcinogenic a "C" will appear in this column.
- (\*12) Wasteload Allocation for acute aquatic criteria (WLAA). Dilution type WLAA is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the acute aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAA formulas for streams:

$$\text{WLAA} = (\text{Cr}/\text{Dilution Factor}) - \frac{(\text{Fs} \times \text{Qrc} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Dilution WLAA formulas for static water bodies:

$$\text{WLAA} = (\text{Cr} - \text{Cu})/\text{Dilution Factor}$$

Cr represents aquatic acute numerical criteria from column (\*8).

If Cu data is unavailable or inadequate, assume Cu=0.

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If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*13) Wasteload Allocation for chronic aquatic criteria (WLAc). Dilution type WLAc is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the chronic aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAc formula:

$$WLAc = (Cr/Dilution Factor) - \frac{(Fs \times Qrc \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAc formulas for static water bodies:

$$WLAc = (Cr-Cu)/Dilution Factor)$$

Cr represents aquatic chronic numerical criteria from column (\*9).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*14) Wasteload Allocation for human health criteria (WLAh). Dilution type WLAh is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the human health numerical criteria for that parameter. Units are in ug/L. Dilution

WLAh formula:

$$WLAh = (Cr/Dilution Factor) - \frac{(Fs \times Qrc, Qrh \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAh formulas for static water bodies:

$$WLAh = (Cr-Cu)/Dilution Factor)$$

Cr represents human health numerical criteria from column (\*10).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*15) Long Term Average for aquatic numerical criteria (LTAA). WLAa numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.32. WLAa X 0.32 = LTAA.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*16) Long Term Average for chronic numerical criteria (LTAc). WLAc numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.53. WLAc X 0.53 = LTAc.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*17) Long Term Average for human health numerical criteria (LTAh). WLAh numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 1. WLAc X 1 = LTAh.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (\*18) Limiting Acute, Chronic or Human Health LTA's. The most limiting LTA is placed in this column. Units are consistent with the WLA calculation.

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If standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then the type of limit, Aquatic or Human Health (HH), is indicated.

- (\*19) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 1.31 to determine the average WQBL ( $LTA_{\text{limiting aquatic}} \times 1.31 = WQBL_{\text{monthly average}}$ ). If human health criteria was the most limiting criteria then  $LTA_{\text{H}} = WQBL_{\text{monthly average}}$ . If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then either the human health criteria or the chronic aquatic life criteria shall appear in this column depending on which is more limiting.
- (\*20) End of pipe Water Quality Based Limit (WQBL) daily maximum in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 3.11 to determine the daily maximum WQBL ( $LTA_{\text{limiting aquatic}} \times 3.11 = WQBL_{\text{daily max}}$ ). If human health criteria was the most limiting criteria then  $LTA_{\text{H}}$  is multiplied by 2.38 to determine the daily maximum WQBL ( $LTA_{\text{limiting aquatic}} \times 2.38 = WQBL_{\text{daily max}}$ ).  
If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then either the human health criteria or the acute aquatic life criteria shall appear in this column depending on which is more limiting.
- (\*21) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. The mass limit is determined by using the mass balance equations above.  $\text{Monthly average WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{monthly average WQBL, lbs/day}$ .
- (\*22) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. Mass limit is determined by using the mass balance equations above.  $\text{Daily maximum WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{daily maximum WQBL, lbs/day}$ .
- (\*23) Indicates whether the screened effluent value(s) need water quality based limits for the parameter of concern. A "yes" indicates that a water quality based limit is needed in the permit; a "no" indicates the reverse.

# **Appendix C**

## **Stream Data**



## MEMORANDUM

TO: Melanie Connor

FROM: Todd Franklin

DATE: January 28, 2010

RE: Stream Flow and Water Quality Characteristics for an unnamed tributary and French Creek, receiving waters for Calumet Lubricants Company, LP / Cotton Valley Refinery (LA0005312 / AI 312)

The discharge from Outfall 002 flows into an unnamed tributary; thence into French Creek. Ambient data for hardness and TSS was taken from random monitoring station #2584 (Little French Creek at the bridge on City Street about 0.1 mile east of Highway 371 in Cotton Valley ). The following results were obtained from five hardness and four TSS samples:

Average hardness = 25.12 mg/l  
15<sup>th</sup> percentile TSS = 5.35 mg/l

Many streams in the area of the discharge point have 7Q10 flows of less than 0.01 cfs. A review of the discharge location indicates that the unnamed tributary has a drainage area of less than one square mile (EDMS Document #36689840). Therefore, the default 7Q10 and harmonic mean flows of 0.1 cfs and 1.0 cfs, respectively, should be utilized for permit limitation calculations.

If you have additional questions or comments, please contact me at 2-3138.

# **Appendix D**

## **Biomonitoring Recommendation**

**BIOMONITORING FREQUENCY RECOMMENDATION  
AND RATIONALE FOR ADDITIONAL REQUIREMENTS**

Permit Number: **LA0005312**  
Facility Name: **Calumet Lubricants Company, L.P./Cotton Valley Refinery**  
Previous Critical Biomonitoring Dilution: **98% (WET Limit)**  
Proposed Critical Biomonitoring Dilution: **90%**  
Date of Review: **01/29/10**  
Name of Reviewer: **Laura Thompson**

**Recommended Frequency by Species:**

*Pimephales promelas* (Fathead minnow): **Once/Quarter<sup>1</sup>**  
*Ceriodaphnia dubia* (water flea): **Once/Quarter<sup>1</sup>**

Recommended Dilution Series: **29%, 38%, 51%, 68%, and 90%**

**Number of Tests Performed during previous 5 years by Species:**

*Pimephales promelas* (Fathead minnow): **19**  
*Daphnia pulex* (water flea): **N/A – Testing of species was not required**  
*Ceriodaphnia dubia* (water flea): **21**

**Number of Failed Tests during previous 5 years by Species:**

*Pimephales promelas* (Fathead minnow): **No failures reported during the past five years**  
*Daphnia pulex* (water flea): **N/A – Testing of species was not required**  
*Ceriodaphnia dubia* (water flea): **1 lethal, 1 sub-lethal**

**Failed Test Dates during previous 5 years by Species:**

*Pimephales promelas* (Fathead minnow): **No failures reported during the past five years**  
*Daphnia pulex* (water flea): **N/A – Testing of species was not required**  
*Ceriodaphnia dubia* (water flea): **Testing period of: 1/1/07-3/31/07 (lethal & sub-lethal)**

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<sup>1</sup> This facility shall have an established biomonitoring testing frequency of once per quarter for the term of the permit

Previous TRE Activities:

An Order for Information Docket Number VI-89-1776, effective October 25, 1989, required the Permittee, while operating as Kerr-McGee Refining Corporation, to conduct a Toxicity Reduction Evaluation (TRE) as a result of lethality being exhibited to *Pimephales promelas* from Outfalls 001 and 002 (*Pimephales promelas* was the only test species contained in the Order). The effluent dilution series contained in the Order consisted of 7%, 13%, 25%, 50%, and 100% concentrations, with 100% effluent as the critical dilution. The monitoring frequency was established at once per month for this species.

Data on file indicates the Permittee determined "the intermittent nature of the toxicity suggested the cause of toxicity was probably linked to specific occurrences of spills, upsets, or other non-continuous activities within the refinery" and further stated that the test results demonstrating lethality "were caused by unrelated events that do not represent typical facility operation." The TRE was completed on February 25, 1991, and since a specific toxicant was not identified, a Whole Effluent Toxicity (WET) limit was incorporated in the permit. This limit was continued in both subsequent renewals effective October 3, 1997 and February 1, 2005.

Additional Requirements (including WET Limits) Rationale / Comments Concerning Permitting:

Calumet Lubricants Company, L.P./Cotton Valley Refinery owns and operates a petroleum refinery in Cotton Valley, Webster Parish, Louisiana. LPDES Permit LA0005312, effective February 1, 2005, contained freshwater chronic biomonitoring (with a WET limit) as an effluent characteristic of combined Outfalls 001 and 002 for *Ceriodaphnia dubia* and *Pimephales promelas*. The effluent series consisted of 31%, 41%, 55%, 73%, and 98% concentrations, with 98% being defined as the critical biomonitoring dilution and WET limit. The testing was to be performed quarterly. Data on file indicate that the permittee has experienced 1 lethal and 1 sub-lethal failure to the *Ceriodaphnia dubia* during the past five years.

The calculation spreadsheet indicates that reasonable potential for future toxicity may exist for the Calumet Lubricants Company, L.P./Cotton Valley Refinery. According to data on file with LDEQ, this facility experienced one lethal and sub-lethal biomonitoring failure to the *Ceriodaphnia dubia* during the monitoring period of 1/1/07-3/31/07. No other toxicity was observed during the permit cycle, with all other tests passing both lethal and sub-lethal endpoints with a critical biomonitoring dilution of 98%. The facility increased the biomonitoring frequency to monthly following the test failure as per the requirements of LA0005312, and the subsequent three consecutive months of testing passed. Based on analysis of this available information, LDEQ has determined that a WET limit is no longer necessary for this facility. In order to generate a complete compliance record, the frequency reduction option will not be available under this reissued permit.

It is recommended that freshwater chronic biomonitoring be an effluent characteristic of combined Outfalls 001 and 002 (discharge of 0.6 mgd) in LA0005312. The samples shall be taken as a flow-weighted composite of Outfalls 001 and 002. The effluent

dilution series shall be 29%, 38%, 51%, 68%, and 90% concentrations, with 90% being the defined critical biomonitoring dilution and WET limit. In accordance with the Environmental Protection Agency (Region 6) WET testing frequency acceleration(s), the biomonitoring frequency shall be once per quarter for *Ceriodaphnia dubia* and *Pimephales promelas* for the term of the permit.

This recommendation is in accordance with the LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan Volume 3. Version 6 (April 16, 2008), and the Best Professional Judgment (BPJ) of the reviewer.